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# A Modern Cooling System for the Milling of Stainless Steel using Adaptive Neuro-Fuzzy Inference System (ANFIS)

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## Abstract

In this paper an innovated method is used for cooling Milling zone of Stainless Steel via Adaptive Neuro-Fuzzy Inference System (ANFIS) using non-touch laser thermometer for non-touch measuring of the temperature. This method is economically appropriate because of its optimization in using coolant. In comparison to the ways which were designed to optimize the ratio of coolant, this method is the best due to its intelligent, fast and trained system via ANFIS. In this method, not only the designing of the ANFIS and using the non-touch laser thermometer makes the cooling process fast but also the accuracy of the system is improved in comparison to the previous designs according to the results in different statistics criteria including MSE, NMSE, R2 and MAPE, which were calculated

**Key words:** Milling of Stainless Steel, cooling system, ANFIS, Optimization.

## 1. Introduction

Heisel (1998) used water for the first time to cool grinding operations; a significant increase on tool life was experienced. From that time, a large variety of coolant fluids have been used for this purpose [1]. Oil-based fluids can be emulsified in water (containing 1 to 20% of oil) or used pure, without any water addition. Using pure oil, mainly because of its